



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCES  
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES  
END OF SEMESTER AUGUST 2024 EXAMINATIONS**

**COURSE TITLE AND CODE:BSN 113: HUMAN PHYSIOLOGY I**

**DATE: THURSADY 15<sup>TH</sup> AUGUST 2024**

Duration: 2 HOURS

Start:

Finish:

**INSTRUCTIONS**

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (20 marks) Section II: Short Answer Questions (30 marks) and Section III: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

**SECTION 1: MULTIPLE CHOICE QUESTIONS****20MARKS**

1. The function of nucleolus is:
  - A. RNA synthesis
  - B. DNA synthesis
  - C. Histone synthesis
  - D. Ribosomal subunit synthesis
2. The primary function of sensible perspiration is to:
  - A. Get rid of wastes
  - B. Protect the skin from dryness
  - C. Maintain electrolyte balance
  - D. Reduce body temperature
3. The basic functional unit of the compact bone is the Haversian system or:
  - A. Osteocyte
  - B. Osteon
  - C. Osteoclast
  - D. Osseus matrix
4. During muscle contraction, the detachment of myosin cross-bridges is directly triggered by:
  - A. The repolarization of T tubules
  - B. The attachment of ATP to myosin heads
  - C. The hydrolysis of ATP
  - D. Calcium ions
5. The primary determinant of the resting membrane potential is:
  - A. The membrane permeability to sodium
  - B. The membrane permeability to potassium
  - C. Intracellular negatively charged ions
  - D. Negatively charged chloride ions in the ECF
6. Receptors that bind acetylcholine at the postsynaptic membrane are:
  - A. Chemically gated channels
  - B. Voltage-gated channels
  - C. Passive channels
  - D. Mechanically gated channels

7. The following are the steps involved in a reflex arc

- 1) Activation of a sensory neuron
- 2) Activation of a motor neuron
- 3) Response by an effector
- 4) Arrival of a stimulus and activation of a receptor
- 5) Information processing

The proper sequence of these steps is

- A. 1,3,4,5,2
- B. 4,5,3,1,2
- C. 4,1,5,2,3
- D. 4,3,1,5,2

8. The reflexes that control the most rapid stereotyped motor response to stimulus are:

- A. Monosynaptic reflexes
- B. Polysynaptic reflexes
- C. Tendo reflexes
- D. Extensor reflexes

9. The establishment of emotions is a function of:

- A. Hypothalamus
- B. Tectum
- C. Limbic system
- D. Mamillary bodies

10. Sound waves are converted into mechanical movements by the:

- A. Auditory ossicles
- B. Cochlea
- C. Oval window
- D. Tympanic membrane

11. A blind spot appears in the retina where:

- A. The fovea is located
- B. Ganglion cells synapse with bipolar cells
- C. The optic nerve attaches to the retina
- D. Rod cells are clustered to form the macula

12. Air moves into the lungs because:

- A. The gas pressure in the lungs is less than atmospheric pressure
- B. The volume of the lungs decreases with inspiration
- C. Contraction of the diaphragm decreases the volume of the pleural cavity
- D. The respiratory control center initiates active expansion of the thorax

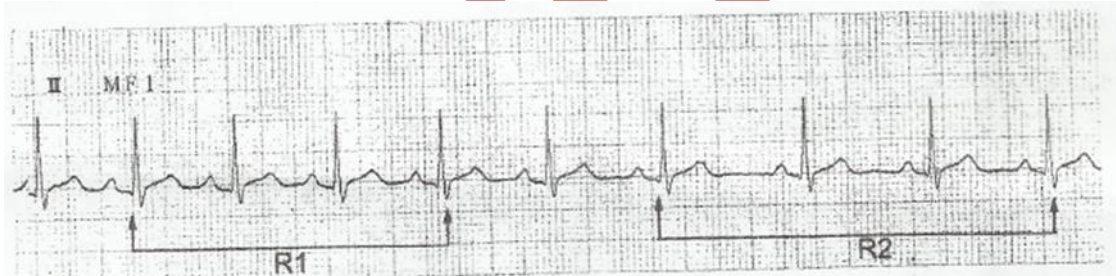
13. Most of the carbon dioxide is carried in the plasma as

- A. Carbonic anhydrase.
- B. Bicarbonate ion.
- C. Carbonic acid.
- D. A gas, carbon dioxide.

14. The muscles that are normally active during quiet inspiration are:

- A. External and internal intercostal muscles
- B. External intercostal muscles and diaphragm
- C. Internal intercostal muscles and diaphragm
- D. External and internal intercostal muscles and diaphragm

15. Using the Figure below, the following statements are correct **EXCEPT**:



- A. This is an abnormal ECG tracing
- B. R1 is sinus tachycardia
- C. There is sinus arrhythmia
- D. R1 represents the inspirational phase of respiration

16. A 2-day-old infant is born with erythroblastosis fetalis. Her blood group is A. For exchange transfusion, the infant should receive:

- A. A-
- B. B-
- C. A+
- D. B+

17. A human subject blood test shows hemoglobin of 8g/dl, MCV=75fl, MCH=26 pg, MCHC =28 g/dl. The subject is likely to have a deficiency of: -
- A. Folate
  - B. Cobalamin
  - C. Iron
  - D. Thrombopoietin
18. The process by which RNA is made from DNA is:
- A. Synthesis
  - B. Translation
  - C. Transcription
  - D. Replication
19. For any partial pressure of oxygen, if the concentration of 2-3 biphosphoglycerate (BPD) increases:
- A. The amount of oxygen released by hemoglobin will decrease
  - B. The oxygen levels in hemoglobin will be unaffected
  - C. The amount of oxygen released by hemoglobin will increase
  - D. The amount of carbon dioxide carried by hemoglobin will increase
20. When the pH of the blood becomes more acidic, the respiratory center
- A. Increases the rate and increases the depth of breathing.
  - B. Increases the rate and decreases the depth of breathing.
  - C. Decreases the rate and increases the depth of breathing.
  - D. Decreases the rate and decreases the depth of breathing

**SECTION II: SHORT ANSWER QUESTIONS-**

**30 MARKS**

1. Using a diagram describe the steps involved in an action potential (8 marks)
2. Explain five (5) hormones associated with blood pressure regulation (5 Marks)
3. Describe five (5) characteristics of all polysynaptic reflexes (5 marks)
4. Trace the olfactory pathway from the time an odor it reaches the olfactory epithelium until impulses reach their final destination in the brain (5 marks)
5. Explain the proposed theory of the origin of ABO blood group antibodies (4 Marks)
6. Explain Two (2) ways pulmonary ventilation differs from alveolar ventilation (3 marks)

**SECTION C: LONG ANSWER/ESSAY QUESTIONS-**

**20 MARKS**

1. Describe the coagulation pathway under the following subtopics
  - a) Extrinsic Pathway (5 Marks)
  - b) Intrinsic Pathway (7 Marks)
  - c) Common Pathway (4 Marks)
  - d) Clinical relevance of aPTT and Prothrombin Time (4 Marks)